

Preface

Dr. Elmer Hutchisson retired on October 1, 1964, after more than seven years as director of the American Institute of Physics, during which he led the Institute through a period of great growth and development. In that time, the Institute enlarged its present headquarters on East 45 Street, almost doubling its area to accommodate its staff. Publishing activities were expanded to meet the growth in scientific research, and stress was placed on documentation studies. Vital education programs were undertaken, often in cooperation with the American Association of Physics Teachers, to meet new needs for physicists and physics teachers. Emphasis was given to activities directed toward the development of greater understanding and appreciation on the part of the public of progress in physics.

Funds for a number of the activities were made available by the National Science Foundation and secured from other sources, and Dr. Hutchisson, with great foresight and imagination, developed the sound programs that now form such an essential and important part of the Institute's work.

In recognition of his vigorous efforts to fulfill the Institute's mission on behalf of physics, the Executive Committee, acting for the Governing Board, conferred upon Dr. Hutchisson the title Director Emeritus at its meeting on December 12, 1964. To this I should like to add my thanks and those of the Institute staff for his inspired leadership. Dr. Hutchisson is responsible for the Annual Report for 1964 which follows. It is fitting testimony of AIP growth under his directorship; it speaks for itself.

At the close of the year, the Governing Board, by mail ballot, elected Dr. Van Zandt Williams director of the American Institute of Physics. Dr. Williams, president-elect of the Optical Society of America, comes to the Institute from the Perkin-Elmer Corporation, where he served as Vice President—Technical Development. His appointment is effective April 1, 1965. To Dr. Williams we extend cordial greetings and good wishes.

It has been my pleasure to serve as acting director in the interim between administrations and to have the benefit of the competent assistance of the AIP staff. To them I express my sincere thanks for their fine cooperation.

Ralph A. Sawyer
Chairman and Acting Director



AIP annual report 1964

Submitted by the director and accepted by
the Governing Board of the American Institute of Physics as its annual report to the
Member Societies of the AIP, March 20, 1965

Introduction

Dr. Ralph A. Sawyer, acting director of the American Institute of Physics, has asked me to prepare the 1964 AIP Annual Report. He has done this partly because I was director for most of the year 1964, but also because it seemed appropriate at this time to note the highlights in Institute growth during my tenure of the past seven and a fraction years, which were such active ones for physics.

The growth of activity at the Institute during this period is readily apparent from the large increase in membership in the member societies of the AIP shown below.

<i>Year End</i>	<i>Total Membership AIP Member Societies</i>
1956	19 912
1964	42 052

Even more striking is the growth in the number, size, and circulation of the journals published by the AIP for its member societies and for itself.

Year	AIP Archive Journals and Bulletins		AIP Translation Journals		Total Circulation
	No.	Total Pages	No.	Total Pages	
1956	11	19 502	4	2 841	71 487
1964	17	45 609	8	15 763	183 912

The rapid growth in publishing activities brought with it many associated problems. An important one was the constant battle to obtain sufficient typesetting capacity able to handle the complex nomenclature of modern physics and to meet its rigorous time schedules, and yet, at the same time, maintain reasonable economy in spite of continuously increasing printing prices. Fortunately, with the aid of increased page charges, the subscription rates of physics journals have been kept remarkably low, as illustrated by the one example given below. Shown also in this table is the growth of *Physics Today*, which over the years has served as the principal means of communication between physicists of widely varying interests.

Journal of Chemical Physics			Physics Today	
Year	Pages	Mem. Sub. Price/Page	Pages	Circulation
1956	2 688	\$0.0045	740	19 900
1964	8 016	0.0027	1 434	43 448

It was clear in 1957 that the methods then in use for billing and allocating cash received and for addressing journals were no longer sufficient to handle the rapidly increasing volume and complexity of AIP and member society operations. Changeover to mechanized procedures was difficult not only because the flow of journals could not be interrupted, but also because the total volume of operations was doubling every three or four years. The first step in this changeover proved to be insufficient, and serious backlogs developed. Fortunately, however, new equipment became available and, with additional staff well versed in mechanized methods, the operations were brought under control; at the present time, the AIP has one of the most efficient data-processing and subscription fulfillment operations in the field of scientific journal publishing. Details on these operations during 1964 are reported in Section 4.

The need for a program of research on publishing problems was already stressed in the AIP Annual Report for 1957. The worldwide growth in volume of material published made it imperative that steps be taken to improve the accessibility of this new knowledge through improved

alerting, abstracting, and indexing services. Such a program was started shortly thereafter and much has been accomplished in cooperation with the editors of the AIP journals and those of the principal abstract journals. Indexes have been improved, the usefulness of citation indexes has been explored, abstract coverage has increased and time lag decreased, and many new techniques have been investigated to improve style, timeliness, and economy of publication. With the constant encouragement and support of the National Science Foundation, the documentation research program with an annual budget of some \$100 000, has achieved worldwide recognition for its pioneering work. Projects under way in 1964 are reported in detail in Section I of the body of this report.

The growth in journal pages reflects the expansion of research activities during this period. Another measure of the expansion is the increase in federal support to the physical sciences, the comparative figures for which are:

Year	Annual Federal Support to Physical Sciences
1956	\$ 99.7 million
1964	1030.9 million

In a democracy, no science can thrive unless the public can know and appreciate what is going on and the way in which science can contribute to the intellectual and material growth of that society. This was already well recognized in 1957, but budgetary restrictions at AIP permitted only a part-time public relations consultant and a secretary. As additional income became available, a vigorous program of unique services was undertaken, the size and status of which is reflected in Section 2. The crowds and excitement in the AIP press rooms at large physics meetings attest to the value of these services to representatives of the press as well as to physicists.

The demand for physicists and physics teachers followed hard on Sputnik I and increased as federal support to the physical sciences increased. Fortunately, as a result of the 1956-57 development fund campaign, the Institute was able in 1957 to have on its staff two visiting physics professors to initiate and carry on educational activities. In 1958, in recognition of the importance of strengthening physics education at all levels, the Governing Board, with the encouragement of the American Association of Physics Teachers, authorized establishment of a separate AIP Department of Education. Under vigorous leadership, and with the aid of several additional grants, a full-fledged educational program was undertaken by this new department. Later it was expanded to

include AIP manpower activities. Its present activities are described briefly in Section 3.

One of the most significant contributions of the Institute over the past eight years has been the further development of Dr. H. A. Barton's dream of a truly fine national headquarters for physics. The building acquired in 1957, plus its new modern wing, serves as an editorial and distribution center for more than a third of the world's physics literature, provides space for the extensive education and public information activities mentioned, and acts as a comprehensive information center on physics organizational activities. It provides in one convenient location several well-appointed meeting rooms and houses, in the Niels Bohr Library, what is rapidly becoming the most complete collection available anywhere of reference works on the history of physics. The growth of the AIP headquarters is dramatically apparent in the following table.

Year End	Staff	Usable Space	Total Annual Expenditures
1956	67	8 000 sq. ft.	\$1 440 128
1964	160	30 000 sq. ft.	5 703 806

Approximately eighty percent of the total expenditures for 1964 listed in the above table are for journal publication, dues, and subscription-fulfillment operations. These expenditures are offset by income from subscriptions, page charges, reprint sales, and back number sales. The non-publishing activities of the Institute (including a small amount of journal underwriting) are financed principally through four major sources: (1) a percentage of the member society dues (ten percent at present), (2) corporate associate support, (3) net advertising income, and (4) grants. The growth in these sources is indicated below:

Year	From Member Societies	Net Corporate Associates Dues	Net Advertising Income	Grants
1956	\$24 711	\$ 11 336	\$103 540	\$ 14 115
1964	60 546	118 418	326 173	553 356

Obviously, the Institute could not have prospered so well over these exciting years without the vigorous assistance and whole-hearted cooperation of many individuals. It is possible here to mention but a few: Henry A. Barton, who retired as director at the beginning of the period, but whose advice and help on difficult problems was always available; Wallace Waterfall, the Institute's indefatigable secretary and treasurer, who has now become acting deputy director; Frederick Seitz and Ralph A. Sawyer, who were chairmen of the Governing Board during the period covered, as well as, for the latter, acting director of the Institute

since October 1, 1964; and the heads of the Institute's major divisions, Eugene H. Kone, William C. Kelly, Hugh C. Wolfe, and Gerald F. Gilbert, who were directly responsible for so many of the activities reported. It is a pleasure also to acknowledge the aid of Dorothy M. Lasky, assistant to the director, who, in a very real sense is the co-author of this and many other reports. Finally, and I am sure I speak for the entire AIP staff, we express a hearty welcome to the new director, Van Zandt Williams, who will take office on April 1, 1965.

1. Publishing Activities

Journal publication is a primary responsibility of the Institute. The year 1964 saw yet another upsurge in the number of pages published in the journals and bulletins of the Institute and its member societies, with the number of pages reaching an all-time high of 45 609 (exclusive of Russian translations), up eighteen percent over 1963. Figure 1 shows the growth over the past five years. In the light of such growth the search for economical and efficient publishing methods continued, including studies of the problems of composition and printing, and of abstracting, storage, and retrieval.

Archive journals

The AIP counts thirteen archival journals and four bulletins in its publishing program. By far the largest increase in number of pages published in any of the society journals occurred in *The Physical Review*, which carried approximately 2500

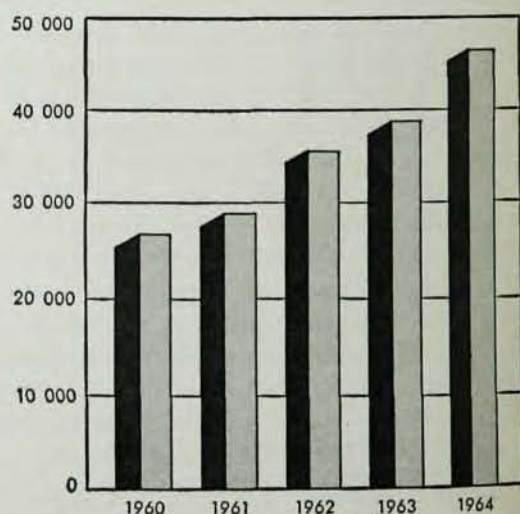


Fig. 1. Total number of pages published annually (exclusive of translations)

more pages in 1964 than in 1963, up 22 percent. *The Physical Review* became a weekly publication on January 6, 1964, and was divided into two sections (A and B). The index is prepared by a new process (Listomatic) and printed by offset. This same technique was used for the annual indexes of several other journals. The journal which showed the next largest increase in number of pages in the AIP family of journals was *The Journal of Chemical Physics*, which carried approximately 1300 more pages in 1964 than in 1963, an increase of 19.4 percent. A new journal added to the list of publications in 1964 was *The Journal of Vacuum Science and Technology*, a bimonthly being published for the American Vacuum Society. The first issue was September-October. The journal, which carries advertising, is edited by Daniel Alpert of the Coordinated Science Laboratory, University of Illinois. Missing from the list of journals published was *Sound*, a publication of the Acoustical Society of America, which terminated with the November-December 1963 issue. In a change of editorship effective December 15, 1964, Frank E. Myers, Associate Laboratory Director for Education of Argonne National Laboratory, was appointed editor of the *Journal of Applied Physics* and *Applied Physics Letters*. Lester Guttman and Foster F. Rieke of Argonne National Laboratory were named associate editors. Dr. Myers replaced J. H. Crawford of Oak Ridge National Laboratory, editor since September 15, 1960, who resigned to devote more time to research.

A number of special issues of journals or supplements devoted to conference proceedings were published in 1964. These were: (1) Part 2 of March *Journal of Applied Physics*, the Proceedings of the Ninth Conference on Magnetism and Magnetic Materials, 12-15 November 1963; (2) Part 1 of January *Reviews of Modern Physics*, the Proceedings of the International Conference on the Science of Superconductivity, August 26-29, 1963; Part 2 of the same issue, the Proceedings of the Third International Conference on the Mössbauer Effect, September 4-7, 1963; (3) Part 2 of November *The Physics of Fluids*, papers from a Symposium on Plasma Guns. There were two commemorative issues during the year. The April *Reviews of Modern Physics* was dedicated to J. Robert Oppenheimer on his 60th birthday; in August *The Physics of Fluids* was dedicated to the memory of Theodore von Karman. The June issue of *American Journal of Physics* is a progress report of the Commission on College Physics.

In the search for speedy printing of programs, the abstracts of papers for the Tenth Annual

Conference on Magnetism and Magnetic Materials, sponsored by AIP and IEEE, were prepared by authors according to special instructions so that they could be copied by direct offset reproduction for the program. This method, which eliminates all copy editing, composition, and proofreading, saves both time and expense. It is being considered by several of the AIP member societies. In another experiment to allow for later abstract deadlines, the *Bulletin of the American Physical Society* for the October meeting of APS was issued at the meeting itself. Several weeks before the meeting, a preliminary program, prepared by typewriter composition and offset reproduction, listing only titles and authors, was mailed to members to provide advance information on the papers to be presented. In the efforts directed toward improved publication, *Applied Physics Letters*, since late in 1964, has been photocomposed using the Mergenthaler Linofilm system. Studies of possible further uses for the tape records generated will be undertaken. The bulk of AIP journal production continues, of course, to be carried out by Lancaster Press, using Monotype composition.

Translated journals

The Institute continued its translation of eight Russian journals, with a total of 15 763 Russian pages translated in the calendar year 1964. Figure 2 charts the pages translated and published in the years 1960 through 1964. Since its inception, the translation program has been underwritten by the National Science Foundation. As subscription income increased, the support required diminished. For the fiscal year ended June 30, 1964, the support

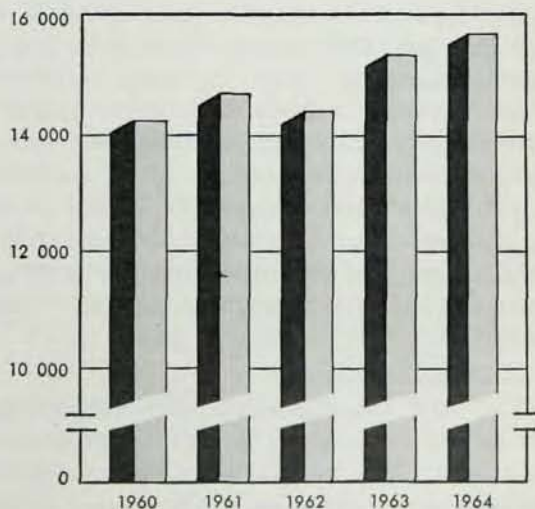


Fig. 2. Russian pages translated and published

needed from NSF was only thirteen percent of the total expense for that year, and no further support after that date has been necessary. A new Russian journal, *Yadernaya Fizika*, to be published beginning with January 1965, has been announced for publication by AIP in translation as the *Soviet Journal of Nuclear Physics*, beginning with July 1965. It is the first translation initiated by the Institute without subsidy. A translation beginning with 1963 issues of *Teplofizika Vysokikh Temperatur* is being published by Consultants Bureau with the cooperation of the AIP. The first issue of the translation appeared early in 1964; its title is *High Temperature*.

Physics Today

As the nonarchival publication of the physics community, *Physics Today* continues to carry articles on subject fields, physics education, meetings, book reviews, news of research programs, physicists, and Institute activities. Total circulation is now approximately 43 500. Since January 1964, the publication has been printed by a new printer in Washington, D. C. on a web-fed rotary letterpress. The new printing arrangements have shortened the time between writing and printing, and allowed the magazine to appear earlier in the month.

Relations with abstracting journals

Physikalische Berichte has been added to the list of abstracting journals (*Physics Abstracts*, *Nuclear Science Abstracts*, *Chemical Abstracts*) receiving advance copies of abstracts of articles from most of the thirteen archival journals. With NSF support to AIP, a conference on the future course of *Physics Abstracts* was held in London in October 1964. AIP was represented by a delegation of nine experts. New agreements with the Institution of Electrical Engineers (British), which publishes *Physics Abstracts*, have been made for 1965. AIP will pay IEE the full cost (\$28) less subscription-handling costs for each subscription placed through AIP by individual members of AIP Member Societies. The "member" price in the United States has been set at \$12, and revenue realized from other sources will be used to make up the difference. Members of the joint AIP-APS Physics Abstracts Committee are now members of the *Science Abstracts* Editorial Advisory Committee of IEE.

Documentation research

The AIP Documentation Research Project is continuing work under an NSF grant which was renewed in July for two years. The project staff, in cooperation with several AIP journal editors, is working to improve existing journal indexes and

other retrieval tools. After two years' trial, the editors and indexers of six AIP journals have reported remarkable response from the authors to the "Aid-to-Indexing" forms (over eighty percent return the form) and they have reported that the information obtained is useful for amplifying the title, evaluating the abstract, indicating the type of research reported, and choosing the subject index entries in the annual or volume index. An index to journal title abbreviations which have appeared in *The Physical Review* has been published. An experiment was conducted for the purpose of evaluating the impact of a citation index to physics literature upon the literature-use habits of physicists. A citation index, listing references to *The Physical Review* and the *Journal of Applied Physics*, which have appeared in four Soviet Physics translation journals, was prepared for this study.

"The Journal Literature of Physics: A Comprehensive Study of 1961 Issues of *Physics Abstracts*" has been published. Information on 405 journals published in 39 countries was collected, and details about the language of the article, number of authors, placement in *PA* subject categories were tabulated. Rank tables and journal profiles are included in this 156-page report. Other studies undertaken were: (1) a survey of authors of *Physical Review Letters* to determine whether material originally published in *PRL* is subsequently treated in other publications, and (2) a survey of member subscribers to *The Physical Review* for opinion concerning the division of subject matter into Sections A and B of the journal and whether members favored separate subscriptions. For a report on these surveys, see *Physics Today*, September 1964, pp. 92-3.

Advertising

The number of journals handled by the AIP Advertising Department remained at eight in 1964, with *The Journal of Vacuum Science and Technology* replacing *Sound* on the list. The number of advertising pages carried in 1964, as may be noted from the table below, was down approxi-

Year	No. of Pages of Advertising
1960	2008
1961	2151
1962	2275
1963	2413
1964	2308

mately two percent from 1963, but revenue was up approximately ten percent. Three of the journals carrying advertising are Institute-owned, and advertising income from them helps support the general activities of the Institute.



Press conference to announce the discovery of the omega-minus particle was held jointly by the American Institute of Physics and Brookhaven National Laboratory on February 21, 1964. The speaker is BNL Director Maurice Goldhaber.

2. Public Information Services

During 1964, the Institute's Public Relations Department served to make available to the press and other media reliable information on developments in physics and news of physicists, met numerous requests from the general public for material relating to physics as part of its information program, and generally worked toward a greater appreciation on the part of the public of progress in physics. Aside from its concern with public information, the Department fostered good AIP personnel relations through publication of the Institute's house organ, *Inside AIP*.

Press rooms at society meetings

Press rooms were manned either by AIP personnel or with the cooperation of universities at major meetings of The American Physical Society, American Association of Physics Teachers, Optical Society of America, Acoustical Society of America, and the Society of Rheology. In addition, cooperation was provided to a summer meeting of the American Crystallographic Association. Over one hundred "authors' versions" in lay language of papers presented at the meetings were made available in the press rooms, and an average of two press conferences a day were conducted for the most newsworthy reports. The atmosphere of such press conferences is deliberately kept on a seminar level to permit judicious questions and answers. Resulting news items reaching the public covered such diverse topics as superconductivity, acoustics, theoretical physics, and optics.

Awards of medals and elections of officers were handled in separately prepared news releases which were given national distribution in the press—a typical mailing includes over 600 newspapers, radio, and television stations.

Public relations support to education programs

In order to publicize the visits by physicists to college campuses under the AAPT-AIP Visiting Scientists Programs in Physics, individual releases

on numerous visits made, including those by foreign physicists, were prepared. Special mailings were made to campus publications, area and state newspapers, radio, and television stations. Clippings indicate excellent coverage. A major mailing takes place whenever a new regional counselor is appointed. For example, in the typical case of one particular state, a special release about the new regional counselor with his biography was distributed to every daily newspaper and major radio and television station in Pennsylvania.

Seminars for science writers

Three seminars were held in 1964 for science writers. In each case the seminars were held prior to a society meeting and served the double purpose of providing background information on an emerging area of physics and of inviting interest of the science writers in the society meeting about to take place. The seminars were: January 21 on High-Energy Physics, chaired by Owen Chamberlain; May 5, Lasers, chaired by Peter Franken; and October 6, Quantum Mechanics, with S. A. Goudsmit and Peter G. Bergmann the two participants. The latter two seminars were supported by NSF; all were jointly sponsored by AIP and the National Association of Science Writers. Average attendance at each seminar was eighty, with science writers coming from newspapers and wire services, radio and TV stations, trade and technical journals, and from university, government, and industrial public relations departments. Glossaries were distributed nationally in conjunction with each seminar. In a continuation of the program, plans were made for the seminar held January 26, 1965 on Quasars.

Interpreting physics journal articles

With support from NSF, major advances in all branches of physics, reported in the journals of the societies and AIP, have been widely publicized through press releases furnished science writers,

radio and TV, and news editors. Under this program, now nearing the close of its second year, the journals are culled for significant and newsworthy articles, with the aid of an advisory board of eight physicists who act as article referees (in the public relations sense). In a typical month, from three to four news releases are issued from the AIP, often in conjunction with the public relations departments of universities, industrial firms, or government agencies. On February 23, 1964, announcement was made through this program of the discovery reported in the February 24 issue of *Physical Review Letters* of the omega-minus particle at Brookhaven. In addition to preparing and distributing an article, a press conference was held and attention was worldwide. Other significant releases have concerned particle physics, laser research, plasma physics, optics, time reversal, ball-lightning explanations, and related topics. The use of these materials by the general press has been gratifying and often surprising. University and other public relations departments are starting to alert AIP on forthcoming developments, scientists are uniformly cooperative, and the advisors have not yet missed a major news story.

Physics information clearing house

During 1964, the number of booklets distributed through the Public Relations Department concerning careers, physics information, and physics literature exceeded 50 000. In addition there were many telephone and mail requests for specific information about research and education which required special handling by the department staff.

3. Education and Manpower

The Institute's Education and Manpower Department continued its efforts to assist in strengthening physics education at all levels and in encouraging qualified students to make physics their career. As may be noted from the brief reports of activities which follow, many elements of the educational process are the concern of the Department. An area in which study of the problems in greater depth was initiated at AIP in 1964 is that of pre-college physics. Reported also are the manpower activities—statistical studies, Student Sections, the work on the National Register, and that of the Placement Service.

Special mention might be made of the growth of interest in the history and philosophy of physics. The work in this area, described briefly in a section below, is attracting considerable attention not only from physicists, historians, and philoso-

phers of science, but from sister societies that are following AIP progress with a view to undertaking similar work in their own disciplines. Serious consideration is being given at AIP to a proposal for the development of a center devoted to the history and philosophy of physics.

Many of the projects under way are joint efforts by the American Association of Physics Teachers and the American Institute of Physics. Cooperation in educational activities is growing between the Institute and other member societies as well, the past year having witnessed the development of close ties between the Institute and committees or groups of the Optical Society of America, the Acoustical Society of America, and the Division of Fluid Dynamics of The American Physical Society. A good number of projects are supported by grants from the National Science Foundation and other foundations. However, the Institute is allotting a growing portion of its own funds to studies in the education area in recognition of the vital need to improve the status of physics as an important part of a basic education at both secondary and college levels.

Committee on Physics Faculties in Colleges

Since its inception in May 1962, the Committee on Physics Faculties in Colleges (COPFIC), in a joint effort of AAPT and AIP under a grant from NSF, has concerned itself with the problems facing the smaller colleges in their efforts to produce better trained physicists. In 1964, COPFIC continued to gather and assess data concerning the difficulties of smaller physics departments in obtaining physics staff and in carrying on a vigorous program. A summary of the preliminary results of its study and some recommendations were contained in an article in the May 1964 issue of *Physics Today*. Another publication of COPFIC was the booklet "Toward Excellence in Physics—Reports from Five Colleges". This provided examples of the practices at five private undergraduate institutions with strong physics programs in the belief that such information would be useful to others.

Several recommendations made by COPFIC were acted upon favorably during the year. Through the support of NSF, the AAPT-AIP Visiting Scientists Program—Colleges has been expanded to provide 200 visits in the 1964-65 program. The first Faculty Register for Summer Employment was published by the AIP on a pilot basis, and it is planned to continue this in 1965. The Committee has recommended to NSF such specific programs for strengthening physics teaching staffs as: (1) a national program for research support in colleges,

(2) a program of physics consultants to colleges, and (3) an expanded program of fellowship and research-participation opportunities for college physicists. A forthcoming publication by COPFIC will be a booklet of examples of publicly-supported institutions that have good physics programs. This will complement the booklet "Toward Excellence in Physics". Also, the Committee has been preparing its final summary report, which will be given wide distribution.

Pre-college physics

The objective of the Pre-College Physics Project, initiated in August 1964, is to study in depth the problems of reinstating physics as an essential element in the high-school curriculum. During an exploratory study in August and September, 53 interested individuals, experienced and knowledgeable with respect to physics education, were interviewed and their ideas and opinions solicited on such matters as the need for physics as part of a good general education, course content, teacher recruitment, teacher preparation, etc. The results were brought together in a 114-page report which was the subject of discussion at a meeting of the Advisory Committee on the AIP Education Program and at the Assembly of Society Officers in October. Many suggested courses of action for increasing high-school physics enrollment and for generally improving physics education were catalogued. From them have emerged the following targets: (1) recruitment, education, and support of physics teachers; (2) improvement of course content; (3) fostering of high-school physics by physicists; (4) evaluation of progress; and (5) bettering attitudes toward physics. The continuing program of interviews has confirmed these targets.

In another phase of the study, the November 1964 issue of *The Physics Teacher* contained a request that high-school physics teachers complete and return an accompanying post card on which they were asked to designate first, second, and third choice as to the reason why more students did not enroll in physics. From returns on the first 1400 cards, the top reasons students did not enroll in physics appeared to be: (1) the student fears his grade average will suffer and his admission prospects for college will be damaged; (2) physics is hard and students avoid it so as to have more time for other activities; and (3) the student is frightened by reports of the mathematical aspects of physics.

Based on studies during 1964, plans are being developed to test some of the many ideas that have been suggested for strengthening pre-college physics.

Regional counselor program

Launched in the fall of 1961, the AAPT-AIP Regional Counselor program continues to promote local cooperation for better physics teaching, with emphasis at the secondary school level. Fifty-two Regional Counselors representing fifty states, the District of Columbia, and Puerto Rico are providing help to meet the needs of their individual states. A second national meeting of Counselors was held at the University of Michigan in Ann Arbor, on May 8-9, 1964, with the support of the General Electric Foundation. Discussion dealt with two areas of greatest concern to physics education: (1) training and recruiting of competent high-school physics teachers, and (2) stimulating greater enrollments in high-school physics. "Regional Counselor Reports" summarizing interesting local educational developments in physics as reported by the Counselors were distributed to the Counselors.

History of physics

The Project for the History of Recent Physics in the United States, under an NSF grant, has continued its efforts to locate, catalogue, and encourage the preservation and use of historical source materials that document the development of physics and the physics community in the United States since the 1890's. It is working closely with individual physicists, professional societies, academic physics departments, and industry to accomplish its aims. Thirty-eight sectional consultants at universities throughout the United States were appointed in 1964 to assist the project. Stimulation of industrial companies and academic physics departments to preserve their historically important records and to write histories of their work in physics has resulted from the project.

The vitality of the project is shown by the increasing rate at which manuscripts, notebooks, diaries, correspondence, and photographs of apparatus of outstanding members of the physics community are being deposited in the History of Physics Archives at AIP and in other depositories. Materials at AIP include the papers of Thomas Corwin Mendenhall, I. Fankuchen, Richard von Mises, Marcel Schein, Alfred Landé, Leonard Loeb, Max Mason, and George Pierce. There is also a large collection of historical information documenting careers of more than 900 physicists who have been especially productive in the United States in the twentieth century. The project has conducted tape-recorded interviews with physicists and has received more than 100 intellectual autobiographies specially prepared for the Archives. The material in the Archives is being used in-

creasingly by historians, physicists, and educators. The project's National Catalogue of Sources for the History of Physics contains a record of pertinent material located at AIP and elsewhere. A newsletter was launched by the project in May to report on activities in the history of physics.

Center for educational apparatus

The AAPT-AIP Center for Educational Apparatus in Physics seeks to stimulate the development and production of new apparatus for instructional purposes, primarily at the college and university level, and to inform physics teachers about what is available. Working with the AAPT Committee on Apparatus for Educational Institutions, the Center worked toward these goals in 1964 with such activities as (1) publication of a reprint volume entitled "Novel Experiments in Physics", (2) conducting a workshop conference on nuclear counters and planning for another on lasers, and (3) undertaking review studies of apparatus, with results to be published in the next several months. One such study already completed is covered in a report submitted to the *American Journal of Physics*. It aims to inform physics departments of various ways in which Mössbauer-effect experiments can be used in a teaching program and what apparatus is required. Others under way cover microwave apparatus, Franck-Hertz tubes, Ferranti diodes, etc.

The Center's information service for physics teachers draws from an extensive file of literature on commercially available apparatus and materials and a large collection of laboratory experiments. Information and news items continue to be channeled through the Center for the Apparatus Notes Section in the *American Journal of Physics*, and liaison is maintained with industry and academic laboratories. A newsletter, "Physics Apparatus News", issued intermittently, reports to manufacturers on activities of the Center. Visits to colleges and manufacturers serve to upgrade the physics laboratory curriculum and to encourage participation and give assistance in the design and development of demonstration and laboratory apparatus. Toward the end of the year, preparation was made for the fourth biennial apparatus competition conducted by the AAPT Committee on Apparatus for Educational Institutions at the 1965 APS-AAPT meeting in New York. Prizes are awarded for new pieces of physics apparatus which, in the opinion of the judges, are most likely to advance the teaching of college physics.

Visiting scientists programs

The AAPT-AIP Visiting Scientists Programs in Physics entered their eighth year in September

1964. Supported by NSF, the programs promote contacts and the exchange of views on educational topics between distinguished physicists and physics departments. During the 1963-64 year, at the college level, 101 physicists, including nine distinguished foreign participants, visited a total of 166 institutions, while 165 visited 242 high schools. For the 1964-65 academic year, the college program is under the direction of William W. Watson of Yale University, the high-school program under Victor J. Young of the AIP Education and Manpower Department, and the foreign visiting scientists program in physics under Serge A. Korff of New York University, each serving as project director on a part-time basis.

International physics activities

Effective September 1, the Information Center on International Physics Activities became a part of the AIP Education and Manpower Department, as a result of the Center's growing concern for educational developments overseas. The Center collects information covering international physics activities; disseminates general information of interest to physicists who wish to study or undertake research in other countries; and provides an exchange of information about educational activities. In connection with the latter, the Center is starting a newsletter, "International Physics Education", as a medium for the exchange of ideas among individuals here and abroad. The Center is also studying, as part of a book and journal program, ways to aid the distribution of privately-owned physics books and back runs of journals to libraries in developing countries. The Center continues to operate under an NSF grant. The May 1964 revision of "Information Booklet on Physics Organizations Abroad" (Pub. R-168, issued by the Center) appeared in a new format, based on a geographic breakdown by cities within countries. Also, the Center is administering a sixth grant from The Asia Foundation in the amount of \$2500 to enable a number of Asian libraries to subscribe to physics journals.

Manpower studies

The 1964 statistical handbook, entitled "Physics—Education, Employment, Financial Support" (Pub. R-161) was issued in July. The handbook contains a wealth of statistics collected as part of the AIP manpower studies under a grant from NSF. It provides information on physics manpower production, utilization, and support. An article, based on some of the educational statistics from the handbook, appeared in the September issue of *Physics Today*. Continuing analyses are underway of AIP surveys and those made by other or-

ganizations, including surveys of physics enrollments and degrees, bachelor's degree recipients, and graduate students. A study is being made of the situation of physics faculties in US colleges and universities.

Among the surveys reported in 1964 have been "1963-64 AIP Survey of Enrollments & Degrees in Physics" (Pub. R-151.1), and its supplement, containing an institution-by-institution report.

In connection with work under NSF contract for the Physics and Astronomy Section of the National Register of Scientific and Technical Personnel, the collection of information for 1964 was completed. About 48 000 questionnaires were mailed in the spring of 1964 to update information in the Register. Of these 36 000 were processed and something over 30 000 were submitted by AIP to the National Register. About 2000 were sent to other societies for processing. Preliminary reports on the data collected will appear in 1965. A report on the results of the 1962 Physics Register appeared in the April 1964 issue of *Physics Today*.

Student sections

AIP Student Sections continued to show gains with about 5000 students enrolled in 250 undergraduate institutions. Program aids, special lectures at society meetings, and the "Student Section Newsletter" provide information, stimulation, and support to the Sections. The Bendix Corporation again sponsored the Awards Program under which grants, up to \$500 each, were made to six Sections, from among twenty proposals submitted, to carry on local projects.

Placement service

Placement activity continued to bring physicists seeking employment to the attention of employers. In 1964, the Placement Service served 1020 registrants. There were 638 specific positions open. An additional 96 employers had an unspecified number of positions available. Of the total number of registrants, 301 were PhD's. Of these, at the time of their registration with the Placement Service, only eight were unemployed. An additional 215 registrants expected to receive their PhD in 1964. Of the 719 non PhD registrants, only 49 were unemployed at the time of registration. As in prior years, Placement Service Registers were held at the January joint annual meeting of APS-AAPT in New York and at the spring meeting of APS in Washington.

The "Registrants' Qualification Book", a quarterly collection of registrants' applications, was made available to prospective employers in academic institutions, industry, and government. Job listings issued included "Summary of Academic

Openings" and "Summer Employment Opportunities for College Physics Students and Teachers or High School Science Teachers". The "Faculty Register for Summer Employment" for the summer of 1965 was distributed without charge to interested employers in December 1964. The purpose of the Faculty Register is to assist faculty members of college physics departments to find summer employment that offers opportunities for increasing professional competence as well as financial return, and to assist employers to locate physicists with the desired qualifications for summer employment. The Faculty Register was prepared by the Placement Service upon the recommendation of the AAPT-AIP Committee on Physics Faculties in Colleges.

Photographic depository

Inaugurated in the spring of 1964, photographs are being collected to show phenomena in physics, apparatus, and physicists and their activities. The depository makes prints available at cost to authors, publishers, and organizations that have a legitimate use for them in publications pertaining to physics.

Special publications

The following publications emanating from the Education and Manpower Department have been revised and updated: 1) AAPT-AIP "Directory of Physics Faculties, 1964-65," Pub. R-135.3, and 2) "List of Colleges and Universities Offering Physics Majors," Revised October 1964, Pub. R-124.3. The "Educational Newsletter" continues to be distributed to about 2500 key people to coordinate activities and encourage widespread cooperation to improve education in physics. The following documents are currently in preparation and are expected to appear in 1965:

1. Supplement to "Modern Physics Buildings". (Grant from Educational Facilities Laboratories, Inc.)
2. Handbook for advisors of prospective graduate students in physics (NSF grant).
3. Booklet on careers in physics in industry, prepared by Donald H. Loughridge for AIP.
4. Revision of booklet "Physics in Your High School".
5. Revision of "Check List of Books for an Undergraduate Physics Library".
6. Revision of "Careers in High School Physics Teaching".

4. Service Operations

The AIP's experience during 1964 with its mechanized dues and subscription fulfillment system indicated an efficient operation had been achieved. The size of the operation is greater than

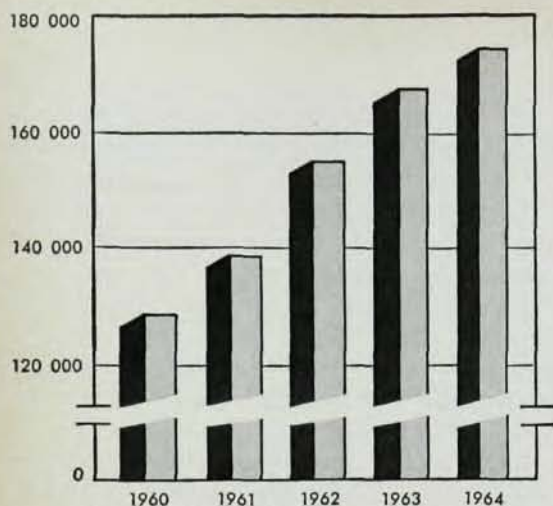


Fig. 3. Total number of subscriptions handled annually (exclusive of translations)

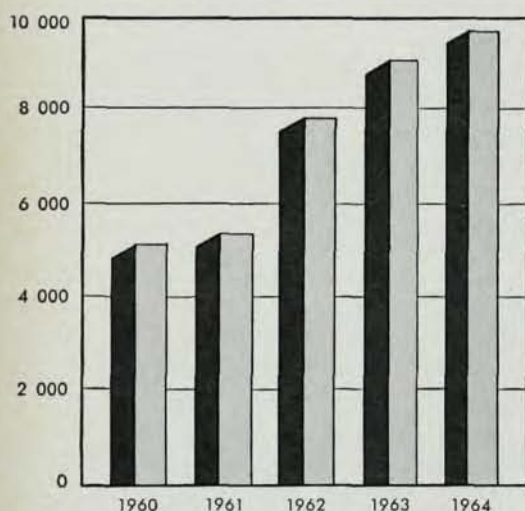


Fig. 4. Circulation of translated journals

ever. Circulation increases are indicated by Figures 3 and 4 for the total of thirty publications now being handled. In addition to handling journal subscriptions and dues records, the Institute continued to provide various special services to the member societies, including the fiscal administration of a number of grants.

Dues billing and subscription renewals for 1965

Both member renewal bills for 1965 and non-member renewal notices for 1965 were mailed during September. They numbered about 56 000 in all. Recipients were notified to make returns prior to December 1 in order to avoid interruption of service. Second notices were sent to members during early November. Approximately eighty percent of the member renewal bills were returned by the year end, representing a three percent increase over 1963. Because of improvements in the operation, costs incurred during 1964 were substantially lower than budgeted, and the proposed budget for 1965

anticipates even lower costs. This was achieved even though the work load increased.

In addition to the billings mentioned, during April approximately 2500 renewal invoices were sent to subscribers to Soviet physics translation journals whose subscriptions expire on June 30. During May, approximately 3000 renewal notices were sent to nonmember subscribers to other journals whose subscriptions expire in mid-year.

Data processing and subscription fulfillment

The UNIVAC 1004 equipment, multiple journal and society lists, Friden Add Punch for cash allocations, and member history cards have made for a smooth and efficient operation. The data-processing system handled approximately 14 000 address changes during the year, and a total of four and a half million labels were printed. In the operation, approximately 42 000 society memberships and 4200 students in AIP Student Sections were serviced. During July, the allocation of cash receipts for back-number sales was converted from a manual to a mechanized process. Numerous procedural refinements were made in streamlining data-processing and subscription-fulfillment operations.

Accounting operations

AIP experience with an NCR Accounting Machine has been successful. It has expedited fiscal closings and the issuance of financial reports to member societies. During 1964, AIP issued about 10 000 checks covering approximately seven million dollars in disbursements. Recently, due to increased workloads, a second, modified NCR machine was added to the Accounting Department. This additional equipment will permit mechanization of the AIP reprint and publication-charge operation in 1965.

Joint meeting of AIP Finance Committee and Committee of Society Secretaries and Treasurers

A meeting was held at the AIP on September 30, 1964 with an agenda emphasizing new methods of distributing costs and policy matters concerning dues and subscription-fulfillment activities. With a few reservations, the new methods were approved by the society officers present and will result in more equitable cost distribution. The 1965 budget was prepared on the basis of these new methods and should result in lower costs to the societies.

Fiscal administration of grants

The AIP continued to act as fiscal agent for member societies for the following grants: (1) an NSF grant to secure source materials for a history entitled, "The Quantum Revolution", a project being carried out under the direction of a joint committee of The American Physical Society and

The American Philosophical Society; (2) an AAPT program of national awards to outstanding high-school teachers of physics, supported by the Carnegie Corporation of New York; (3) an NSF grant to publish for three years starting in 1962, *Applied Optics*, a journal of the Optical Society of America; and (4) an NSF grant to support a conference sponsored by the Acoustical Society of America to evaluate the role and significance of acoustics in higher education and industry.

Special society services

Among the services rendered the societies were special mailings made during the course of the year. These consisted of announcements, programs, membership promotions, society journal promotions, and ballots. AIP assisted the APS Board of Tellers in elections. Printing was often handled in connection with mailings. In connection with society meetings, AIP handled space and administrative arrangements for the joint APS-AAPT meeting in New York and assisted with other society meetings in New York. New membership directories were prepared and issued for the Society of Rheology and for the American Crystallographic Association.

5. Special Activities

The foregoing sections show the variety of the programs toward which the Institute's staff directed its efforts. In addition to the specific programs mentioned, the administrative officers were concerned with general operation of the Institute, with cooperating with other scientific organizations, with Institute meetings, and with a number of special activities closely associated with the Director's Office. These are briefly reported below.

AIP personnel surveys

In the interest of maintaining good personnel policies, in September 1964 AIP retained the services of Smyth & Murphy Associates, Inc., a consulting firm, to undertake a formal job-evaluation and salary-administration study of all positions in the AIP. The purpose of this survey was to put in writing the principal responsibilities and duties of positions and compile an equitable salary administration program. The survey showed that 85 percent of AIP personnel were in their proper salary range. Among the results of the survey were the institution of procedures for annual work performance reviews and establishment of a salary review committee. Based on another survey of pension and insurance benefits made by the AIP Ad Hoc Pension Plan Study Committee, improved plans effective January 1, 1965 allow

AIP to keep pace with fringe-benefit improvements in other organizations of its kind.

Liaison activities

In addition to close liaison with its Member and Associate Member Societies, AIP maintained numerous contacts with its sister societies, and participated in the meeting of Managing Officers of Scientific Societies (MOSS) held in Providence, June 29-30, to discuss mutual problems and programs. During 1964, AIP also continued its close cooperation with a number of international organizations, including UNESCO, the International Union of Pure and Applied Physics (IUPAP) and its Symbols, Units, Nomenclature (SUN) Commission, International Federation for Documentation (FID), etc.

AIP meetings

Seventh Annual Meeting of Corporate Associates:

The meeting was held in New York at The Rockefeller Institute on October 1, with E. R. Piore and R. A. Sawyer as chairmen. One-hundred fifty persons attended. In addition to reports on trends in physics, particularly stimulating discussion centered around the topic, "The Crisis in Physics Education". Another featured talk was on "Science and Public Policy". The roster of Corporate Associates for 1964 numbered 166 corporations, laboratories, and institutions.

Sixth Assembly of Society Officers: Held at The Biltmore Hotel, from September 30 to October 2, the Assembly examined Institute-Society relationships. Also, the Assembly devoted much of its time to consideration of problems relating to physics enrollments in high schools.

Meetings jointly sponsored by AIP and others:

As in prior years, the annual conference on magnetism and magnetic materials, held in Minneapolis on November 16-19, 1964, was sponsored jointly by AIP and the Institute of Electrical and Electronics Engineers. In addition, AIP has entered into a new cooperative effort with IEEE. The Joint Council on Quantum Electronics, sponsored by both organizations, is planning a conference on quantum electronics in 1966. In yet another joint endeavor, AIP and IUPAP are jointly sponsoring the 1967 International Magnetism Congress to be held in Cambridge, Mass.

Niels Bohr Library of the History of Physics

There has been considerable growth in the collections in the Niels Bohr Library of the History of Physics during 1964. Devoted primarily to 19th and 20th century works, the library now contains over 3000 volumes. In addition to the book purchases made possible from funds contributed by the Friends of the Niels Bohr Library, outstand-

ing presentations were: (1) the Espenschied Collection of 800 volumes in the field of electricity and electrical technology presented by the Bell Telephone Laboratories, Inc., and (2) the handsome collection containing 180 volumes of collected works, texts, and classical papers from the personal library of S. L. Quimby, Treasurer of The American Physical Society. A classification scheme has been developed to meet the needs of a special library in the history of physics, and cataloguing of library material is well in hand.

For 1964, the Friends of the Niels Bohr Library numbered 247 and contributed a total of close to \$9500 for the purchase of books. Some 500 titles have already been purchased with these funds; many of the books were multivolume sets. Friends are informed of developments in the Library through a quarterly newsletter and an annual which summarizes activities for the year.

Award

The Dannie Heineman Prize for Mathematical Physics was awarded on April 29, 1964, in co-operation with The American Physical Society, to Tullio Regge, professor of physics at the University of Turin, for important papers introducing into particle theory the concept of analytic continuation in angular momentum.

6. Finances

Appendix II gives the audited Summary Statement of Operations and the Balance Sheet for activities during 1964, including those for the member societies. In this section, the income and ex-

penditure items are regrouped into three broad categories to show the different programs in AIP operations. As may be seen from the figures, it has been a good year, showing a net gain of \$211 876. This gain has eliminated the accumulated deficit of prior years, and \$150 000 has been transferred to a reserve for replacement of the AIP building.

In connection with journal, dues, and subscription fulfillment operations, expenditures for the member societies balance income since expenditures are charged at cost. For the Institute-owned archive journals, increased income resulted from subscriptions, lower subscription-handling costs, and from increased income from page charges. During the second half of the year, a net was also realized on the Soviet translation journals. These journals have been operating without subsidy since the mid-year.

Shown in category II are the operations supported by grants. These come principally from NSF, and are described in prior sections of the report. The third category of operations cover basic AIP public information, education, and manpower departments, as well as the maintenance of the libraries and meeting rooms, and general liaison activities of the principal administrative officers. These activities are supported by unrestricted income coming largely from the net from advertising, Corporate Associate dues, and a tithe of member society dues. Included also as a general activity is the publication *Physics Today*, which serves as a principal communication link among all physicists. The total cost of the publication

I. Journal, Dues, and Subscription Fulfillment Operations

	Income	Expense
<i>Operations for Societies, Including Services</i>	\$2 562 337	\$2 562 337
<i>AIP Archive Publishing</i>		
Review of Scientific Instruments (excluding advertising)	199 750	176 729
Journal of Chemical Physics	530 865	490 892
Journal of Applied Physics (excluding advertising)	352 430	308 270
Physics of Fluids	154 782	150 914
Journal of Mathematical Physics	134 014	130 786
Applied Physics Letters	52 873	71 810*
Soviet Translation Journals	495 519	431 787*
Style Manual and Miscellaneous	2 700	940
Advertising and Exhibits (handling and printing costs)	261 814**	261 814
	<u>\$2 184 747</u>	<u>\$2 023 942</u>
<i>Total</i>	<u>\$4 747 084</u>	<u>\$4 586 279</u>

* Excluding expenses chargeable to grants

** Includes only that part of income needed to balance expense

II. Operations Supported by Grants

	<i>Income</i>	<i>Expense Including Overhead</i>
<i>Publishing</i>		
Soviet Translation Journals (grant underwriting)	\$ 12 051	\$ 12 051
Applied Physics Letters (grant underwriting)	10 592	10 592
Documentation	109 755	109 755
Miscellaneous Publishing Activities	5 092	5 092
<i>Public Information</i>		
Seminars for Science Writers	15 646	15 646
Journal Article Interpretation	23 245	23 245
<i>Education and Manpower</i>		
Visiting Scientists Programs	87 179	87 179
Committee on Physics Faculties in Small Colleges	17 399	17 399
History of Recent Physics in the United States	44 093	44 093
Apparatus Center	45 546	45 546
Information Center on International Physics	32 704	32 704
Physics Register	51 935	51 935
Manpower Studies	21 827	21 827
Regional Counselor Program (grant portion)	6 500	6 500
Student Sections (grant portion)	2 500	2 500
Handbook for Advisors of Prospective Graduate Students	1 172	1 172
<i>Member Society Grants Handling by AIP</i>	66 120	66 120
<i>Total</i>	<u>\$ 553 356</u>	<u>\$ 553 356</u>

III. General AIP Operations

Sources of Income

	<i>Income</i>
Member and Associate Member Society Contributions	\$ 60 546
Corporate Associate Dues (Net)	118 418
Advertising and Exhibit (Net)	345 986
Physics Today Subscriptions	28 053
Pamphlet Sales, Including Placement Service Book	17 336
Royalties	18 299
Investment Income	16 769
Student Section Dues (Net)	3 432
Miscellaneous Income	6 403
	<u>\$ 615 242</u>

Items of Expense

	<i>Expense</i>
Physics Today	\$ 220 355
Public Relations Administration	58 779
Journal Article Interpretation	7 748*
Education and Manpower Administration	85 876
Regional Counselor Program	12 338*
Student Sections	27 588*
Placement Service	18 897
Pre-College Physics	10 287
Liaison and General Administration	121 465*
Miscellaneous	838
	<u>\$ 564 171</u>

* Excluding expenses chargeable to grants

Summary

	<i>Income</i>	<i>Expense</i>
<i>I. Journal, Dues, and Subscription Fulfillment Operations</i>	\$4 747 084	\$4 586 279
<i>II. Operations Supported by Grants</i>	553 356	553 356
<i>III. General AIP Operations</i>	615 242	564 171
	<u>\$5 915 682</u>	<u>\$5 703 806</u>
<i>Net Gain</i>	<u>\$ 211 876</u>	

for 1964 was \$220 355, but since *Physics Today* carries advertising and has a substantial paid circulation, it contributes an unrestricted income to the Institute of \$264 977, for a net balance of \$44 622.

While the close of 1964 found AIP in a strong financial position, reserve funds can advantageously be used toward reduction of the existing mortgage on the headquarters building and to provide a cushion against lean years.

7. Acknowledgments

In addition to the individuals mentioned in the Introduction, a special thank you goes to the Institute's able staff, which in 1964 numbered 160, for their diligent efforts in performing the many tasks confronting them in carrying out the Institute's programs in a year of changing directorship. Sincere appreciation is also expressed to the large number of committee and board members

who, by their voluntary help, guided and assisted the Institute in its activities during the year. The membership of the 1964 AIP committees is given in Appendix I.

Particular thanks are due the following members of the Governing Board who retired early in 1965 after serving the period indicated:

S. S. Ballard	1962-1965
Malcolm Correll	1962-1965
James Hillier	1962-1965

At the close of the year, AIP mourned the loss of Horace M. Trent, representative of the Acoustical Society of America on the Board, who died on December 16, 1964. Cyril M. Harris has been appointed to fill the vacancy. A warm welcome is extended to him and to the other new board members: Melba Phillips, John Sanderson, and Edward Creutz.

The Institute also welcomes two new affiliated societies: the Instrument Society of America and the Physics Club of Richmond.

Respectfully submitted,
Elmer Hutchisson
Director Emeritus

APPENDIX I

American Institute of Physics Governing Board, Committees, and Appointed Representatives for 1964

Governing Board

Ralph A. Sawyer, Chairman
 Stanley S. Ballard
 Laurence Batchelder
 James T. Bergen
 E. U. Condon
 Malcolm Correll
 H. Richard Crane
 Seibert Q. Duntley
 Herbert A. Erf
 S. A. Goudsmit
 W. W. Havens, Jr.
 A. C. Helmholz
 James Hillier
 R. Bruce Lindsay
 Richard C. Lord
 A. I. Mahan
 John C. Miller

Vincent E. Parker

E. R. Piore
 S. L. Quimby
 Paul M. Routly
 Frederick Seitz
 Horace M. Trent
 Frank Verbrugge
 Mary E. Warg
 Elizabeth A. Wood

Executive Committee

Ralph A. Sawyer, Chairman
 S. A. Goudsmit
 W. W. Havens, Jr.
 R. Bruce Lindsay
 Vincent E. Parker
 S. L. Quimby
 Mary E. Warg

Publication Board

J. B. H. Kuper, Chairman
 Dirk Brouwer
 E. U. Condon
 J. H. Crawford, Jr.
 R. R. Davis
 F. N. Frenkiel
 S. A. Goudsmit
 R. B. Lindsay
 D. L. MacAdam
 W. C. Michels
 Elliott Montroll
 S. Pasternack
 J. W. Stout
 Elmer Hutchisson (to 9/30/64)
 Ralph A. Sawyer (from 10/1/64)
 Wallace Waterfall
 H. C. Wolfe, Secretary

**Ad Hoc Committee to
Review Editorial Structure
of AIP Journals**

S. A. Goudsmit, Chairman
Walker Bleakney
R. A. Sproull

**Ad Hoc Committee to Select
Editors for the *Journal of
Applied Physics* and *Applied
Physics Letters***

Herbert I. Fushfeld, Chairman
J. E. Goldman
W. W. Havens, Jr.
Henry Hurwitz, Jr.
Sidney Millman

Advisory Board on Translations

Robert T. Beyer, Chairman
J. George Adashko
Freeman J. Dyson
Dwight E. Gray
Morton Hamermesh
David Harker (representing ACA)
Paul M. Routly (representing AAS)

**Science Abstracts Committee (Joint APS-
AIP—expires end of APS annual meeting)**

F. G. Brickwedde, Chairman
Dwight E. Gray
Conyers Herring
Elmer Hutchisson (to 9/30/64)
Ralph A. Sawyer (from 10/1/64)
S. L. Quimby
(Hugh C. Wolfe, Secretary)

**Advisory Committee on
Documentation Research Program**

Serge A. Korff, Chairman
Paul Camp
Gilbert King
Jerry B. Marion
K. G. McKay
S. Pasternack
Robert T. Beyer (ex officio)
F. G. Brickwedde (ex officio)
J. B. H. Kuper (ex officio)

**Advisory Panel on Journal
Interpretation Project**

Henry A. Boorse
Cyril M. Harris
W. W. Havens, Jr.
W. Lewis Hyde (from 8/31/64)
Alan Kolb
Benjamin Lax
Melvin Schwartz
Charles A. Whitney
Van Zandt Williams (to 7/31/64)

Advisory Committee on Public Relations

Horace M. Trent, Chairman
Harry F. Arader
Robert F. Bacher
John J. Hastings
W. Lewis Hyde
Vincent E. Parker
Harold S. Renne
Walter Sullivan
William R. Willets

**Advisory Committee on
AIP Education Program**

Edward U. Condon, Chairman
H. Richard Crane
Samuel K. Allison
Stanley S. Ballard
R. Bruce Lindsay
Arthur B. Metzner
Louis A. Turner

Advisory Committee on Manpower

John N. Shive, Chairman
Fay Ajzenberg-Selove
Herman Branson
Lindsay R. Harmon
Thurston E. Manning
L. G. Parratt
Marsh W. White
Van Zandt Williams
(Thomas J. Mills—Observer)

**Committee on History and Philosophy
of Physics (also serves as Advisory
Com. for the Project on History of
Recent Physics)**

Gerald Holton, Chairman
Sanborn C. Brown
Karl K. Darrow
Charles C. Gillispie
Martin Klein
Thomas S. Kuhn
R. Bruce Lindsay
Henry Margenau
Raymond J. Seeger
R. S. Shankland
Cyril Stanley Smith
G. E. Uhlenbeck

Advisory Committee on Student Sections

Leonard O. Olsen, Chairman
S. S. Ballard
David F. Griffing
W. W. Havens, Jr.
Myron A. Jeppesen
Jere J. Lord
Walter J. Rhein, S.J.
Dan A. Thomas

**Ad Hoc Panel of Judges for
Student Section Awards**

David F. Griffing
W. W. Havens, Jr.
Myron A. Jeppesen

**Committee to Designate
Student Sections**

H. A. Barton
Elmer Hutchisson (to 9/30/64)
W. C. Kelly
Ralph A. Sawyer (from 10/1/64)

**Advisory Committee on the Regional
Counselor Program (AAPT)**

Leonard O. Olsen, Chairman
E. U. Condon
H. R. Crane
Vincent E. Parker

Regional Counselors in Physics

Howard Carr, Alabama
William S. Wilson, Alaska
John W. Robson, Arizona
Paul C. Sharrah, Arkansas
Donald H. Loughridge, California
Paul F. Bartunek, Colorado
M. J. Walker, Connecticut
Ferd. E. Williams, Delaware
Lewis Slack, District of Columbia
Stanley S. Ballard, Florida
James W. Simmons, Georgia
Iwao Miyake, Hawaii
E. B. McNeil, Illinois
R. W. Leffer, Indiana
Edson R. Peck, Idaho
Grant O. Gale, Iowa
S. Winston Cram, Kansas
Fred Boercker, Kentucky
Bill J. Good, Louisiana
Clarence E. Bennett, Maine
Howard Laster, Maryland
M. W. P. Strandberg, Massachusetts
W. W. McCormick, Michigan
Philip Youngner, Minnesota
Charles B. Galloway, Mississippi
Alexander Calandra, Missouri
Nathaniel J. Kutzman, Montana
Walter R. French, Jr., Nebraska
David P. Marsh, Nevada
Allen L. King, New Hampshire
Peter Lindenfeld, New Jersey
Ralph Dressel, New Mexico
Robert L. Sells, New York
Sherwood Githens, Jr., North Carolina
J. Donald Henderson, North Dakota
Stefan Machlup, Ohio
Richard G. Fowler, Oklahoma
James J. Brady, Oregon
Richard L. Brown, Pennsylvania
Jose Medina-Hernandez, Puerto Rico
John A. Dillon, Jr., Rhode Island
Frederick H. Giles, Jr., South Carolina
V. R. Nelson, South Dakota
C. J. Craven, Tennessee
J. G. Potter, Texas
Thomas J. Parmley, Utah
A. D. Crowell, Vermont
S. M. Heflin, Virginia
G. L. Hollingsworth, Washington
Donald C. Martin, West Virginia
Richard G. Netzel, Wisconsin
C. A. Cinnamon, Wyoming

**Committee on Physics Faculties
in Colleges (AAPT)**

Robert B. Brode, Chairman
Fay Ajzenberg-Selove, Secretary
H. H. Barschall
Peter Bergmann
W. C. Elmore
Charles Fowler
Ronald Geballe
George Pake
G. C. Phillips
K. Strauch
W. W. Watson

**Advisory Committee on Center for
Educational Apparatus in Physics
(AAPT)**

Allan M. Sachs, Chairman
Walter R. French, Jr.
John G. King
Harry F. Meiners
H. V. Neher
Alan M. Portis
Howard P. Stabler
W. C. Kelly, Secretary

**Advisory Committee on the Visiting
Scientists Programs in Physics (AAPT)**

Mark Zemansky, Chairman
Lyle Borst
Robert B. Brode
E. Creutz
Harald H. Nielsen
Fay Ajzenberg-Selove

**AIP Members of Magnetism
Conference Advisory Committee**

Richard M. Bozorth
J. F. Dillon, Jr.
William D. Doyle
John A. Osborn
J. Samuel Smart
(Exp. November 1964)
W. C. Koehler
Richard J. Prosen
George T. Rado
Werner P. Wolf
(Exp. November 1965)
A. M. Clogston
Simon Foner
Julius M. Hastings
Israel S. Jacobs
Louis R. Maxwell
(Exp. November 1966)

**Advisory Committee on AIP Corporate
Associates Program**

E. R. Piore, Chairman
James B. Austin
Robert A. Charpie
Edward Creutz
Michael Ference, Jr.
Herbert I. Fushfeld
Peter C. Goldmark
S. Millman
Van Zandt Williams
W. E. Shoupp

**Sectional Consultants for the
History Project**

E. Scott Barr
John Beer
Otto Benfey
Raymond T. Birge
Alfred M. Bork
Herbert P. Broida
Robert A. Chipman
D. M. Dennison
Samuel Devons
Bern Dibner
Ray L. Doran
Daniel Greenberg
W. E. Haisley
Thomas J. Higgins
John R. Holmes
J. B. Johnson
Robert Katz
Daniel J. Kevles
Robert T. Lagemann
K. Manfred
Robert Maybury
Leonard Muldower
Ronald Newburgh
Otto Oldenberg
R. Ronald Palmer
Earle K. Plyler
Herbert Priestley
Karlem Riess
Duane H. D. Roller
Alfred Romer
Robert Schofield
William T. Scott
John W. Stewart
J. D. Tebo
E. A. Uehling
David Wheatland
Frederick White
Homer C. Wilkins

**Advisory Committee for Information
Center on International Physics Activities**

Laurence Batchelder, Chairman
Wallace R. Brode
Sanborn C. Brown
Karl K. Darrow
R. S. Rivlin
Hilliard Roderick

**Committee to Administer Grant from
Asia Foundation**

Howard A. Robinson, Chairman
Bernhard Kurrelmeyer
Henry Semat

**Advisory Committee on AIP
Library Policy**

Elmer Hutchisson, Chairman
(to 9/30/64)
Dorothy M. Lasky, Chairlady
(from 10/1/64)
Pauline A. Atherton
W. C. Kelly
Stella Keenan
Ralph A. Sawyer (from 10/1/64)
Wallace Waterfall
Charles Weiner
H. C. Wolfe

**Committee of Society
Secretaries and Treasurers**

J. W. Buchta
Karl K. Darrow
Joseph R. Dillinger
Frank K. Edmondson
Herbert A. Erf
William L. Kehl
A. I. Mahan
John C. Miller
S. L. Quimby
Paul M. Routly
Mary E. Wurga
Wallace Waterfall
Ralph P. Winch

Finance Committee

James T. Bergen (SOR), Chairman
J. W. Buchta (AAPT)
Herbert A. Erf (AcSoc)
A. I. Mahan (OSA)
S. L. Quimby (APS)
Paul M. Routly (AAS)
Elizabeth A. Wood (ACA)

AIP Pension Committee

Mark W. Zemansky, Chairman
B. S. McCutchen
Kathryn Setze
Theodore Vorburger
Wallace Waterfall, Secretary

**AIP Ad Hoc Pension Plan Study
Committee**

S. L. Quimby, Chairman
Mark W. Zemansky
B. S. McCutchen

AIP Property Committee

Mark W. Zemansky, Chairman
W. W. Havens, Jr.
Elmer Hutchisson (to 9/30/64)
B. S. McCutchen
Ralph A. Sawyer
Wallace Waterfall

**Ad Hoc Committee to Survey
Activities of the Institute &
Select Candidates for Director**

R. B. Lindsay, Chairman
S. S. Ballard
James T. Bergen
W. W. Havens, Jr.
Vincent E. Parker
Ralph A. Sawyer (ex officio)

**Ad Hoc Committee to Recommend
Candidate(s) for Second
John T. Tate Award**

R. B. Lindsay, Chairman
S. S. Ballard
S. A. Goudsmit

REPRESENTATIVES

Division of Physical Sciences,
National Research Council
Ralph A. Sawyer
Elmer Hutchisson (to 9/30/64)

ASA Sectional Committees: Y-1
(Abbreviations), Y-10 (Letter
Symbols), Y-15 (Preferred Practice
for the Preparation of Graphs, Charts,
and Other Technical Illustrations).

David Biesel

AAAS Cooperative Committee on the
Teaching of Science and Mathematics

Lewis Slack

USANC of IUPAP

Wallace Waterfall

ASA Acoustical Standards Board

F. V. Hunt

American Council on Education

Robert B. Brode
E. U. Condon
W. C. Kelly
Leonard O. Olsen
M. H. Trytten
Frank Verbrugge

AAAS Council

Horace M. Trent
Mary E. Wurga

National Commission for UNESCO

William A. Nierenberg

Advisory Board of the Office
of Critical Tables of the NRC

Dwight E. Gray

Scientific Manpower Commission

W. C. Kelly
John Shive

Board of *Acta Metallurgica*

R. Smoluchowski

Conference on Teacher Education
and Professional Standards
(National Education Association)

Richard L. Brown
Glenn W. Giddings
Sherwood Githens, Jr.
Robert L. Henry
Haym Kruglak

US National Committee of FID

Elmer Hutchisson

AAAS Science and Engineering
Television Journal

W. Reeves Tilley

Organizing Committee for 1967
International Magnetism Congress

Wallace Waterfall
Hugh C. Wolfe

APPENDIX II

American Institute of Physics, Incorporated

SUMMARY STATEMENT OF OPERATIONS

Including Activities Carried on for Member Organizations Year Ended December 31, 1964

Income:	Total	American Institute of Physics	For Account of Member Organizations	Expense:	Total	American Institute of Physics	For Account of Member Organizations
Subscriptions	\$1 225 922.76	\$ 631 094.46	\$ 594 828.30	Printing, Engraving and Mailing Journals	\$2 122 510.71	\$ 965 108.26	\$1 157 402.45
Publication Charges	1 625 985.30	687 160.30	938 825.00	Printing and Mailing Reprints	145 961.51	77 954.38	68 007.13
Reprint Sales	186 631.41	91 971.08	94 660.33	Publication Charges and Reprint Sales	28 031.19	13 728.76	14 302.43
Back Number Sales	113 341.73	42 541.66	70 800.07	Handling	41 523.93	17 382.59	24 141.34
Contract for Publication	8 390.73	8 390.73	—	Back Numbers Handling and Distribution	266 473.26	226 215.87	40 257.39
Advertising	641 696.32	552 389.25	89 307.07	Advertising—Printing, Distribution, and Selling	472 295.79	349 478.13	122 817.66
Support from Member Organizations	60 546.11	60 546.11	—	Circulation	8 951.24	5 452.06	3 499.18
Associate (Corporation) Dues	118 418.00	118 418.00	—	Promotion	261 616.47	129 043.13	132 573.34
Interest Earned on Savings Account	14 234.78	14 234.78	—	Subscription Handling	227 357.66	227 357.66	—
Income from Investments	2 533.98	2 533.98	—	Soviet Physics Journals—Expense	421 674.33	421 674.33	—
Soviet Physics Journals— Gross Income	271 118.00	271 118.00	—	Administrative and Organizational Services	707 514.58	707 514.58	—
Income from Special Projects, Administrative Fees, Royalties, etc.	843 179.68	843 179.68	—	Investment Expense	559.57	559.57	—
Miscellaneous Income	29 767.51	29 767.51	—	Disbursements on Behalf of Mem- ber Organizations	141 481.88	—	141 481.88
Receipts for Ac- counts of Member Organizations	773 915.75	—	773 915.75		\$4 845 952.12	\$3 141 469.32	\$1 704 482.80
	<u>\$5 915 682.06</u>	<u>\$3 353 345.54</u>	<u>\$2 562 336.52</u>	Net to Organizations to Balance Accounts	857 853.72	—	857 853.72
					<u>\$5 703 805.84</u>	<u>\$3 141 469.32</u>	<u>\$2 562 336.52</u>
				Net Profit Transferred to Accumulated Surplus	\$ 211 876.22	\$ 211 876.22	

American Institute of Physics, Incorporated

BALANCE SHEET

December 31, 1964

ASSETS				LIABILITIES			
Operating Fund				Operating Fund			
Cash		\$ 489 201.55		Accounts Payable	\$ 387 814.51		
Savings Account		914 273.66		Commissions Payable	24 146.78		
Due from Member Organizations:				New York State Disability Insurance Withheld	645.97		
Acoustical Society	\$ 5 715.71			Accrued Interest Payable on Mortgage	2 985.52		
American Association of Physics Teachers	4 992.72			Abstract Charges Payable	14 710.00		
American Crystallographic Association	1 385.02	12 093.45		Due to Member Organizations			
Accounts Receivable:				American Astronomical Society	\$ 1 986.59		
Publication Charges	\$ 318 693.45			American Physical Society	180 084.60		
Reprint Sales	38 594.72			Optical Society of America	75 318.96		
Advertising	56 692.49			Society of Rheology	13 233.90	270 624.05	
Miscellaneous	14 149.58	428 130.24		Sundry Creditors	14 109.06		
Deposits		925.00		Unallocated Receipts	3 026.83		
Prepaid Expenses:				Deferred Credits:			
Contribution to Retirement Plan Applicable to 1965	\$ 2 351.57			Subscriptions Received Applicable to Issues of Journals to be Published Subsequent to December 31, 1964	\$ 926 086.42		
Engraving Costs Applicable to 1965	29 754.59			Corporate Associate Dues—Year 1965	77 027.00		
Translation Costs Applicable to 1965	12 969.00			Student Section Dues—Year 1965	6 379.00		
Prepaid Insurance	4 201.65			Sundry Receipts—1965 Activities	70 133.33	1 079 625.75	
Prepaid Postage	2 191.21			Due to Special Purpose Funds	84 342.21		
Other	4 538.73	56 006.75	\$1 900 630.65	Accumulated Surplus	18 599.97	\$1 900 630.65	
Special Purpose Funds				Special Purpose Funds			
Karl Taylor Compton Fund:				Karl Taylor Compton Fund	\$ 11 772.02		
Cash	\$ 768.08			John T. Tate Memorial Fund	16 455.37		
Investment	11 003.94	\$ 11 772.02		NSF Income Accounts	2 059.04		
John T. Tate Memorial Fund:				Special Gifts Fund	62.63		
Cash	\$ 455.37			Friends of the Niels Bohr Library Fund	7 967.92		
Investment	16 000.00	16 455.37		Yetta Berns Memorial Fund	226.63		
NSF Income Accounts		2 059.04		Reserve for Replacement of Building	150 000.00		
Investment Advisory Account:				Amounts Received for Special Projects (Net After Expenditures Thereon)	56 229.91		
Cash	\$ 1 773.00					244 773.52	
Investments	\$102 954.22						
Add:							
Accrued Interest Receivable	282.97	103 237.19	105 010.19				
Due from Operating Fund			84 342.21				
Amounts due for Funds Expended for Special Projects for Accounts of Others		25 134.69	244 773.52*				
Property and Equipment Fund				Property and Equipment Fund			
Land		\$ 266 535.36		Mortgage Payable, 5%, Due 11/1/77,			
Building	\$1 320 986.70			Amortization Quarterly	\$ 318 454.50		
Less: Accumulated Depreciation	248 327.31	1 072 659.39		Property and Equipment Capital	1 127 261.60		
Furniture and Fixtures	\$ 163 028.60					1 445 716.10	
Less: Accumulated Depreciation	56 507.25	106 521.35	1 445 716.10				
			\$ 3 591 120.27				\$ 3 591 120.27

* Note: In December 1964 the Institute received a gift of ten (10) shares of General Motors Corporation Common Stock for the establishment of an Albert A. Michelson Memorial Fund. Its value is not included in the assets stated above. The market value of the shares on 31 December 1964 was \$978.75.

Corporate Associates

American Institute of Physics

The Corporate Associates of the American Institute of Physics are a group of corporations, institutions, and laboratories who believe it is valuable to them and to America to maintain a vigorous advance in the physical sciences. By their membership dues they aid the Institute significantly in carrying out its purpose: the advancement and diffusion of knowledge of the science of physics and its application to human welfare. The Institute is grateful for their assistance.

CORPORATE ASSOCIATES OF THE INSTITUTE

Academic Press Inc.
Aerospace Corporation
Airborne Instruments Laboratory
Allegheny Ludlum Steel Corporation
Allen-Bradley Company
Allis-Chalmers Manufacturing Co.
American Cyanamid Company
American Machine & Foundry Co.
American Oil Company
American Optical Company
American Science and Engineering
Ampex Corporation
Applied Physics Corporation
Armco Steel Corporation
Armstrong Cork Company
The Atlantic Refining Company
Avco-Everett Research Laboratory
Avco Research & Advanced Development
Baird-Atomic, Inc.
Ball Brothers Research Corporation
Barnes Engineering Company
Battelle Memorial Institute
Bausch & Lomb Incorporated
Beckman Instruments, Inc.
Bell & Howell Research Center
Bell Telephone Laboratories, Inc.
Bendix Corporation
The Boeing Company
Bolt Beranek and Newman Inc.
Borg-Warner Corporation
The Budd Company
Burroughs Corporation
California Research Corporation
The Carborundum Company
The Carpenter Steel Company
Carrier Corporation
Caterpillar Tractor Company
CBS Laboratories
Celanese Corporation of America
Central Scientific Company
Chemstrand Research Center, Inc.
Chrysler Corporation
Clevite Corporation
Collins Radio Company
Consultants Bureau Enterprises, Inc.
Continental Can Company, Inc.
Cornell Aeronautical Laboratory, Inc.
Corning Glass Works
Crane Company
The Detroit Edison Company
Douglas Aircraft Co., Inc.
The Dow Chemical Company
E. I. du Pont de Nemours & Co., Inc.
Eastman Kodak Company
Electronic Associates, Inc.
The Eppler Laboratory, Inc.

Fairchild Camera & Instrument Corp.
The Firestone Tire & Rubber Co.
Ford Motor Company
General Aniline & Film Corporation
Photo & Repro Division
General Dynamics Corporation
General Electric Company
General Motors Corporation
General Precision, Inc.
General Radio Company
General Telephone & Electronics
Laboratories, Inc.
The Gillette Company
The B. F. Goodrich Company
The Goodyear Tire & Rubber Co.
W. R. Grace & Co.
Grumman Aircraft Engineering Corp.
Gulf Research & Development Co.
Halliburton Co.
The Harshaw Chemical Company
Hercules Powder Company
High Voltage Engineering Corp.
HRB-Singer, Inc.
Hughes Aircraft Co.
Humble Oil & Refining Company
IIT Research Institute
Institute for Defense Analyses
International Business Machines Corp.
International Harvester Company
Itek Corporation
ITT Federal Laboratories
Jarrell-Ash Company
Joslyn Mfg. & Supply Co.
Kelsey-Hayes Company
Kennecott Copper Corporation
Knowles Electronics, Inc.
Kollsman Instrument Corporation
Leeds & Northrup Company
Leesona Moos Laboratories
Libbey-Owens-Ford Glass Co.
Ling-Temco-Vought, Inc.
Arthur D. Little, Inc.
Litton Industries, Inc.
Lockheed Aircraft Corporation
McDonnell Aircraft Corporation
McGraw-Hill Book Company, Inc.
Marathon Oil Company
Martin Company
Minnesota Mining & Manufacturing Co.
The Mitre Corporation
Monsanto Company
Motorola Semiconductor Products
Division
The National Cash Register Company
National Research Corporation

North American Aviation, Inc.—Science
Center
Northrop Corporation
Olin Mathieson Chemical Corp.
Operations Research Incorporated
Outboard Marine Corporation
Owens-Corning Fiberglas Corporation
Owens-Illinois Glass Co.
Parke Mathematical Laboratories, Inc.
Pergamon Press, Inc.
The Perkin-Elmer Corp.
Philips Laboratories, Div. of
North American Philips Co., Inc.
Phillips Petroleum Company
Pilkington Brothers Limited
Pitney-Bowes, Inc.
Pittsburgh Corning Corp.
Pittsburgh Plate Glass Company
Glass Division
Polaroid Corporation
The Proctor & Gamble Company
Radio Corporation of America
The Rand Corporation
Republic Steel Corporation
Reynolds Metals Company
Robertshaw-Fulton Controls Company
Schlumberger Well Surveying Corp.
Scientific American
Shell Development Company
Socony Mobil Oil Company, Inc.
Sperry Rand Corporation
Sprague Electric Company
A. E. Staley Manufacturing Co.
Sun Oil Company
Technical Operations, Inc.
Texaco, Inc.
Texas Instruments, Inc.
TRG, Incorporated
TRW Space Technology Laboratories
Union Carbide Corporation
Union Oil Company of California
United Aircraft Corporation
United Gas Corporation
United States Rubber Company
United States Steel Corp.
Universal Oil Products Company
The Upjohn Company
Varian Associates
Vitro Laboratories
Division of Vitro Corp. of America
The Warner & Swasey Co.
Westinghouse Electric Corporation
Whirlpool Corporation
Wyandotte Chemicals Corporation
Xerox Corporation
Zenith Radio Corporation

The American Institute of Physics cordially invites interested corporations and institutions to make application for Corporate Associate membership and will welcome their inquiries addressed to the Secretary.